

# Biogeography of the water flea *Daphnia* O. F. Müller (Crustacea: Branchiopoda: Anomopoda) on the Indian subcontinent

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## Abstract

© 2016, Journal of Limnology. All rights reserved. Studies on *Daphnia* distribution in Indian subcontinent have been few and regionally restricted despite *Daphnia* being by far the most studied cladoceran. We here present a first biogeographical assessment of the genus on the Indian subcontinent (Afghanistan, Pakistan, India, Nepal, Bhutan, Bangladesh and Sri Lanka). We collected all pertinent literature and considered nineteen bioclimatic variables along with latitude, longitude, and altitude for statistical analysis of factors governing distribution in space. Significant variables (determined by Kruskal Wallis test) were tested by nonparametric multivariate analysis of variance (PERMANOVA) to clarify whether *Daphnia* species had specific environmental requirements. Canonical correspondence analysis was used to understand how environmental variables affected distribution. Eight *Daphnia* (*Ctenodaphnia*) and 4 *Daphnia* s.str. occurred at 100 different localities. The variables temperature, altitude and latitude differed among species and so did their bio-climatic requirements. *Daphnia* distribution responded positively to altitude and negatively to a decrease in latitude and temperature. We confirm the existence of three complexes of *Daphnia* in the Indian subcontinent: i) widely distributed species and species complexes; ii) high altitude endemics; and iii) low latitude *D.* (*Ctenodaphnia*) species.

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## Keywords

*Ctenodaphnia*, *Daphnia magna*, *Daphnia pulex*, Himalayas, Oriental zone, Western ghats